REMARKS

Claims 1-49 were pending in the present application prior to this Amendment. Claims 18-32, 48, and 49 are withdrawn from consideration as being directed to a non-elected species.

In the present Amendment, claims 18-32 are cancelled above. Claims 1, 2, 33, and 34 are amended above. New claims 50-81 are added above. Entry of the amended claims and new claims is respectfully requested.

The Applicant notes that the Office Action Summary does not indicate whether the drawings filed in the application are acceptable. Confirmation of their acceptability is respectfully requested.

The Applicant further notes that receipt of the Information Disclosure Statements filed May 13, 2004 and December 15, 2003 have not yet been acknowledged in the application. The Applicant respectfully requests that an initialed copy of the submitted documents be included with the next official paper transmitted by the Office as confirmation of receipt of the Information Disclosure Statements, and as confirmation of consideration of the listed references.

The Applicant further notes, with appreciation, that the Office Action indicates at page 3, paragraph 4 that claims 13, 14, 45, and 46 would be allowable if rewritten in independent form. Accordingly, new independent claim 52 is added above to include the limitations of former claim 13 in independent form. New dependent claim 53 is added above to include the limitations of former claim 14. New dependent claims 54-67 include the limitations of former dependent claims 2-12 and 15-17. New independent claim 68 is added above to include the limitations of former claim 45 in independent form. New dependent claim 69 is added above to include the limitations of former claim 46. New dependent claims 70-81 include the limitations of former dependent claims 34-44 and 47. Entry and allowance of the newly added claims are respectfully requested.

Claims 1-4 and 33-36 stand rejected as being anticipated by Barker (U.S. Patent No. 6,253,125). Claims 1-4, 7-12, 15-17, 33-36, 39-44 and 47 stand rejected as being anticipated by Yoshikawa, *et al.* (U.S. Patent No. 6,523,786). Claims 5, 6, 37 and 38 are rejected as being unpatentable over Yoshikawa, *et al.* Reconsideration and removal of the rejections are respectfully requested.

The present invention as claimed in amended independent claim 1 is directed to a system for determining the orientation of a land-based object relative to a source of electromagnetic radiation. The system includes a housing that is constructed and arranged to be positioned at a stationary, land-based location. A plurality of sensors are on the housing, each of the sensors producing a corresponding output signal when placed in the path of electromagnetic radiation emitted by a single source. A controller is on the housing for receiving the output signals of the sensors, and for determining the orientation of the stationary object including the housing relative to the single source based on the sensor output signals.

The present invention as claimed in amended independent claim 33 is directed to a method for determining the orientation of an object relative to a source of electromagnetic radiation. An object is placed at a stationary, land-based location. Electromagnetic radiation emitted by a single source is received at a plurality of sensors on the object, each of the sensors producing a corresponding output signal in response to the received electromagnetic radiation. An actual position of the single source of electromagnetic energy is determined based on the sensor output signals. A theoretical position of the single source of electromagnetic energy is computed. The actual position and the theoretical position are compared to determine the orientation of the stationary object.

With regard to the rejection of claim 1 for anticipation based on Barker, it is submitted that Barker fails to teach or suggest the present invention as claimed. In particular, Barker fails to teach or suggest a system that includes "a housing that is constructed and arranged to be positioned at a stationary, land-based location." Instead, in Barker, the object is a satellite and

the housing for the object is configured for orbital positioning. In addition, Barker fails to teach or suggest a system that includes "a plurality of sensors on the housing, each of the sensors producing a corresponding output signal when placed in the path of electromagnetic radiation emitted by a single source." Instead, the Barker system includes a sensor processor 6 that is configured to receive and process sensor data from sun sensors 7, gyro sensors 8, earth sensors 9, and star trackers (see Barker, Figure 1 and corresponding text at column 3. lines 23-30). Thus, multiple sources of energy are sensed in Barker to make a determination of the satellite's attitude. In addition, Barker fails to teach or suggest a system that includes "a controller on the housing for receiving the output signals of the sensors, and for determining the orientation of the stationary object including the housing relative to the single source based on the sensor output signals." Instead, the Barker system determines the attitude of a moving satellite in orbit, and not the orientation of an object at a stationary, land-based location.

With regard to the rejection of claim 33 for anticipation based on Barker, it is submitted that Barker fails to teach or suggest the present invention as claimed. In particular, Barker fails to teach or suggest a method that includes "placing an object at a stationary, land-based location." Instead, in Barker, the satellite is in orbit, and is moving. In addition, Barker fails to teach or suggest a method that includes "receiving, at a plurality of sensors on the object, electromagnetic radiation emitted by a single source, each of the sensors producing a corresponding output signal in response to the received electromagnetic radiation." Instead, in Barker, energy from multiple sources, including the sun, earth, and stars is processed, as described above. In addition, Barker fails to teach or suggest a method that includes "determining an actual position of the single source of electromagnetic energy based on the sensor output signals; computing a theoretical position of the single source of electromagnetic energy; and comparing the actual position to the theoretical position to determine the orientation of the stationary object. Instead, Barker determines the actual position of multiple sources of electromagnetic energy, and compares their relative positions to determine the attitude of the moving satellite.

It is therefore submitted that Barker fails to teach or suggest the present invention as claimed in independent claims 1 and 33. Accordingly, reconsideration and removal of the rejections, and allowance of the claims are respectfully requested. With regard to the various dependent claims 2-4 and 34-36, it follows that these claims should inherit the allowability of the independent claims from which they depend.

With regard to the rejection of claim 1 for anticipation based on Yoshikawa, *et al.*, it is submitted that Yoshikawa, *et al.* fails to teach or suggest the present invention as claimed. In particular, Yoshikawa, *et al.* fails to teach or suggest a system that includes "a housing that is constructed and arranged to be positioned at a stationary, land-based location." Instead, in Yoshikawa, *et al.*, the object is a satellite and the housing for the object is configured for orbital positioning. In addition, Yoshikawa, *et al.* fails to teach or suggest a system that includes "a plurality of sensors on the housing, each of the sensors producing a corresponding output signal when placed in the path of electromagnetic radiation emitted by a single source." Instead, the Yoshikawa, *et al.* system receives an image of multiple stars as multiple sources of radiation, and processes the image of the multiple stars using pattern recognition to determine the present attitude of the satellite (see Yoshikawa, *et al.*, FIGs. 1-5, and column 4, lines 29-58). In addition, Yoshikawa, *et al.* fails to teach or suggest a system that includes "a controller on the housing for receiving the output signals of the sensors, and for determining the orientation of the stationary object including the housing relative to the single source based on the sensor output signals." Instead, the Yoshikawa, *et al.* system determines the attitude of a moving satellite in orbit, and not the orientation of an object at a stationary, land-based location.

With regard to the rejection of claim 33 for anticipation based on Yoshikawa, *et al.*, it is submitted that Yoshikawa, *et al.* fails to teach or suggest the present invention as claimed. In particular, Yoshikawa, *et al.* fails to teach or suggest a method that includes "placing an object at a stationary, land-based location." Instead, in Yoshikawa, *et al.*, the satellite is in orbit, and is moving. In addition, Yoshikawa, *et al.* fails to teach or suggest a method that includes "receiving, at a plurality of sensors on the object, electromagnetic radiation emitted by a single

source, each of the sensors producing a corresponding output signal in response to the received electromagnetic radiation." Instead, in Yoshikawa, *et al.*, the energy from multiple star sources is sensed, as described above. In addition, Yoshikawa, *et al.* fails to teach or suggest a method that includes "determining an actual position of the single source of electromagnetic energy based on the sensor output signals; computing a theoretical position of the single source of electromagnetic energy; and comparing the actual position to the theoretical position to determine the orientation of the stationary object. Instead, Yoshikawa, *et al.* senses the energy of multiple star sources, and compares their relative positions using image pattern recognition to determine the attitude of the moving satellite.

In is therefore submitted that Yoshikawa, *et al.* fails to teach or suggest the present invention as claimed in independent claims 1 and 33. Accordingly, reconsideration and removal of the rejections, and allowance of the claims are respectfully requested. With regard to dependent claims 2-4, 7-12, 15-17, 34-36, 39-44, and 47, it follows that these claims should inherit the allowability of the independent claims from which they depend.

With regard to the rejection of claims 5, 6, 37, and 38, as being unpatentable over Yoshikawa, *et al.*, it is submitted that since Yoshikawa, *et al.* fails to teach or suggest the above-stated limitations of independent claims 1 and 33, it follows that Yoshikawa, *et al.* further fails to teach or suggest dependent claims 5, 6, 37, and 38. Accordingly, reconsideration of the rejection of claims 5, 6, 37, and 38, and allowance of the claims, are respectfully requested.

With regard to newly submitted dependent claims 50 and 51, it is submitted that neither of the cited references teaches or suggests the limitations of the base claims from which they respectively depend, as described above, and further, neither reference teaches or suggests a system or method wherein the "land-based location is an earth-based location", in which "the single source of electromagnetic radiation is external to the atmosphere of the earth" so that the "path of electromagnetic radiation from the single source to the sensors passes through the atmosphere of the earth", for the reasons described above. Accordingly, entry and allowance of

dependent claims 50 and 51 are respectfully requested.

Closing Remarks

It is submitted that all claims are in condition for allowance, and such allowance is respectfully requested. If prosecution of the application can be expedited by a telephone conference, the Examiner is invited to call the undersigned at the number given below.

Respectfully submitted,

Date: December 22, 2005

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